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ABSTRACT

This study investigated the potential relationships between selected self-reported health behaviors of middle school students and interacting factors, including parents, family life, social networks, and society at large. Sixth grade students (n=103) responded to five survey instruments: (1) Standard Albuquerque Public Schools Health Knowledge Test; (2) Health Attitudes Measure; (3) General Locus of Control Scale; (4) Health Locus of Control Scale; and (5) Self-Evaluation Inventory. A discussion is presented on the results of each of the tests. In considering conclusions, it is suggested that while health educators should emphasize high knowledge gain in health education, combined with good decision making skills, their impact on actual student behavior is limited. Other mitigating circumstances have a high influence on students' health behaviors, including parental behavior, family structure, role modeling, religion, and economic level. Data from the study are appended. (JD)

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SELECTED HEALTH BEHAVIORS AND ASSOCIATED PSYCHOLOGICAL VARIABLES AMONG A GROUP OF MIDDLE-SCHOOL STUDENTS

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INTRODUCTION

A majority of today's health problems are directly related to personal behaviors of the individual. Consequently, health researchers are primarily interested in investigating possible causal relationships between a myriad of independent variables (knowledge, attitudes, beliefs, decision-making processes, etc.) and the dependent variables of health behavior (smoking or not smoking; diet habits; exercise patterns, etc.). These relationships, if established, are often integrated into a behavioral theory, such as Social Learning Theory, Communications Theory, Problem-Behavior Theory, Coping Theory and various multiple theory models such as The Health Belief Model and PRECEDE!

Attitudes and behaviors of adolescents are almost always well established by ages 10-13. There are a myriad of interacting factors that mold these behaviors and attitudes, including but by no means limited to parents, family life, social networks and society at large. Through analyses of these influence on attitudes and behaviors, relationships can be determined which may formulate patterns that can be either reinforced, if positive, or perhaps changed in positive ways if negative.

Purpose of the Study

The study was an exploratory descriptive survey with an intent to investigate the potential relationships between selected self-reported health behaviors and selected psychological constructs. The study population included 103 sixth-grade students enrolled in a middle-school health education class in a selected middle school in Albuquerque, New Mexico.

Hypotheses

Descriptive data analyses directed exploration of possible relationships between self-reported health behaviors and psychological measures. In the subsequent evaluation of possible relationships the null hypothesis was assumed to be true, and the critical value for rejection was either .05 or .01, depending upon the measure and statistical technique.

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METHODOLOGY

The 103 sixth-grade students were administered a series of several instruments during a week in January, 1981. Consequently, some data are missing due to absent students. The study represents a one time exploratory descriptive study, directed towards hypotheses generation.

Instrumentation

Five instruments were administered to gather data. These are briefly described:

1. Standard Albuquerque Public Schools Health Knowledge Test

   This instrument is a standard instrument which was validated by extensive field tests. It measured knowledge in all content areas including dental health, mental and emotional health, nutrition, consumer health, exercise, etc. 100 multiple-choice items.

2. Health Attitudes

   This instrument was oriented towards what one ought or should do to foster good health. It consisted of 45 items, including nutrition, exercise, emotional and family health, prevention and control of diseases, and consumer health. Answers were given as either agree or disagree. Content validity established by a panel of judges.

3. General Locus of Control Scale

   Norwicki's and Strickland's scale made up of 11 items. This scale for children scored yes or no, has had extensive use in the literature.

4. Health Locus of Control Scale

   A scale for children with 11 items. Does not have well established validity, but has been used in several exploratory studies.

5. Self-Evaluation Inventory

   This instrument was developed out of a good number of items. All items had factor analysis, factor loading data from validation studies. The 21 item instrument had three items from seven psychological constructs,

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randomly listed. These included: clarity of personal goals; values and acceptance of responsibility, self esteem; self-concept in social relationships; decision-making; communication; and coping skills. The items were LIKERT scored, from 1. -Not at all true of me to 5. -Completely true of me.

Limitations

Several significant limitations apply to the study. First, the population represents all sixth grade students who had just completed a health course. The selected middle-school comprised a population of about 60% white and 35% Hispanic, with 5% Black/ Native American/Oriental. External validity is limited by time (January, 1981) and place (unique ethnic make-up of Albuquerque).

Because students had just completed a health course, and the only pretest data available was the knowledge test scores, one must assume that the course itself was a major confounding or intervening variable. The data summarized in Table 1 indicate that students did increase their basic knowledge level about health between the pretest and posttest. However, it is a supposition, with much evidence, that knowledge of and by itself is a poor predictor of either positive or negative health behavior. The results of the student confirmed this supposition for this population.

Statistical Procedures

Data collected was first put into descriptive form, either as measures of central tendency or frequency counts and percentages. Investigation of possible relationships between the studied variables was determined by chi-square, t-test for significance, and phi coefficient (nominal data) to estimate Pearson r for strength of association. For interval data, contingency coefficients using linear regression analysis were computed. In some cases an independent t-test was used.

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RESULTS AND DISCUSSION

Self Reported Behaviors

The data presented in Table 2 summarize the reported behaviors for the population. One of the major issues in school health research is the challenge to such data without physiological, observational, or similar measures to verify self-report.[2] This questionnaire was coded, but not completely anonymous, so some of the negative behaviors are like underreported. Almost all of these behaviors have been studied more extensively on an individual basis.

A majority (84%) of the students reported that they take good care of themselves. However, other than getting eight hours of sleep each night and getting exercise through play, the collective representation of positive health behavior indicated that far fewer than 84% actually practiced, at least consistently, positive health behavior.

Quite notable in this sample is the high number of drug experimenters (items 9, 11, 13), but relative low number of reported regular users (items 10, 12, 14). Numerous studies indicate that as children grow older more of them become experimenters, and more of the experimenters become regular users.[3]

Sex Gender and Self-Reported Behaviors

National statistics have indicated that the percentage of both male and female smokers between 12 and 18 decreased between 1974 and 1979. However, in 1979 a higher proportion of females (12.7%) than males (10.7%) were smoking in this age group.[4] Data presented in Table 3 indicate a significant gender difference (although variance only about 30%) in terms of drug experimentation (males slightly more likely than females) in this population. Other studies indicate that any research into health behavior should control for sex gender.[5] No other differences were noted.

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Parental Behavior and Student Behavior (Tables 4,5,6)

The only relationship established in this area was that between student "use of drugs" and parent(s) "use of alcohol." Other detailed studies in this area indicate that other parental influences may be even more important than role behavior, specifically, the expressed attitudes of parents[5] (expressing a distinct attitude of nonacceptance highly correlated to nonuse of drugs) and number of parents[7] (one parent family children more likely to use drugs).

Descriptive Measures

In general, this group of students would fall within normal parameters on all measures. Considering that students had just completed a semester of health, one might expect that students marked the correct answer, not necessarily because it was true, but that it ought to be true (i.e., I should exercise so I will say that I do.). There was no way to control for this possible bias.

Students demonstrated a relatively modest knowledge of health, and attitudes seem reflective of knowledge. The "General Locus of Control" mean indicates that the group scored on the side of the continuum toward "internal" locus of control, but considering the SD, and regression towards the mean, the group should be considered neither external (things happen to me because of fate or chance) nor internal (things that happen to me I determine).

"Health Locus of Control" group mean clearly indicates a group neither internal nor external in terms of their perceptions about their control over becoming ill. Children of this age group may still feel subjugated to parents and authority figures like nurses and doctors. When they do get ill (unless it's an accident) it is most often associated with a cold or flu, and not a lifestyle oriented problem. The validity of the "Health Locus of Control" scale should be seriously questioned.

Considering the complexities of developmental tasks (Piaget

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and Kohlberg), one would find it highly extraordinary to find high self-evaluation scores with a homogenous distribution in this population. The modest group mean and reflective heterogeneity of scores would meet normal expectations.

Relationships Between Psychological Variables (Tables 8,9)

Most germane to the study was not the description of the population, but how the variables related to one another. The only measure that correlated consistently with other measures was posttest knowledge.

A positive and relatively strong association (r=0.65) existed between knowledge and attitudes. As noted earlier, based upon the intervening variable "health course" completion, student knowledge levels (posttest) would have reflected an attitude about what a person ought to or ought not to do in regards to health. This relationships would be expected, and did in fact exist.

Posttest knowledge scores were inversely related to the general "locus of control scores." The higher the knowledge score the lower, or more internal, the "locus of control" score. Although this was not a strong inverse relationship, such a relationship would be theoretically expected. There was also a positive relationship between posttest knowledge scores and self-evaluation scores. This corroborates the generalization that good students tend to have higher self-esteem and make better decisions.

One important research question among health researchers is can we measure the general construct "locus of control" within the domain of health? The relationship between the two measures of "locus of control" in this study was weak at best, and one can make no conclusions with a high degree of confidence. Furthermore, the "Health Locus of Control" data demonstrated no relationship whatsoever to either "self-evaluation" data or "health attitudes." Theoretically, a linear positive relationship should exist between internal "locus of control," positive self-evaluation, and positive health attitudes and, conversely, between external

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"locus of control" and perhaps negative self-evaluation. Either these variables were truly mutually exclusive, or one or more of the instruments were invalid. I question the construct validity of the health "locus of control" scale.

The data summarized in Table 9 resulted in acceptance of the null hypothesis. "Health Locus of Control" did not differ between seat belt users and non-users; self-evaluation scores did not differ between drug users and non-users nor regular users and the rest of the population. However, the mean of regular users (61) was lower than all others (79.75). We must conclude, however, that this was a chance occurrence.

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CONCLUSIONS AND RECOMMENDATIONS

The data collected indicate that knowledge and attitudes can be measured, that knowledge is related to other psychological constructs, but their relationship to self-reported behaviors was not conclusively established. In essence, high knowledge levels and positive attitudes (or conversely, negative attitudes), neither predict positive nor negative health behaviors.

Knowledge scores were related, inversely, to general "locus of control" scores, and positively to self-evaluation scores. These relationships may not have existed prior to the health course. Even if they did, these variables are only partially responsible for health behaviors. In this study, health behaviors were independent from these psychological constructs as well.

As numerous other studies indicate, the establishment of causal relationships between independent variables and dependent variables (the behaviors) is extremely complex. High knowledge levels, internal "locus of control" and even high self-evaluation scores do not predict, with any degree of confidence, positive health behaviors. So many other mitigating circumstances exist (parental behavior, family structure, role modeling, religion, economic level) that a myriad of other tenable hypotheses should be formulated. Researchers must, in my view, evaluate a very specific behavior for a very specific homogenous population to establish causal relationships. Our abilities to generalize will be limited.

Health educators should, and must, still emphasize high knowledge gain combined with good decision making skills. But we must recognize our limitations in expecting to impact specific health behaviors. We are only one "input" among many. Should we, then, be held accountable for health behavior decisions of students? I think not. First, ethically and morally, any recipient of health education programs must maintain the freedom of choice to determine for himself/herself whether or not he/she

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should adopt the behavior purported conducive to health. Second, we represent but one small influence in the total sphere of a student's life. Society, in general, must accept responsibility for that total environment.

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TABLE 1
KNOWLEDGE OF HEALTH

Pretest	Posttest	df	t*	Sig.
N=87	N=87			
X=56.29	X=68.59	86	9.64	*.01
SD=18.26	SD=18.68			

*Matched t-test 4 with df=86 t must equal or exceed 2.633 for sig. at .01 level.

TABLE 2

Self-Reported Behaviors (N=90)

	ITEM	TRUE OF ME (FAMILY) %	NOT TRUE OF ME (FAMILY) %
1.	I take good care of myself because I want to be happy and healthy	84	7
2.	My family seems concerned about its' health	74	18
3.	I average at least 8 hours sleep each night	83	17
4.	I regularly use dental floss and a soft toothbrush	54	46
5.	I always eat a good breakfast	57	4
6.	I regularly eat a "balanced" diet containing meat or protein, fruits, vegetables, and grain products	68	32
7.	My daily activities include vigorous physical effort (bicycling, jogging, sports)	78	22
8.	My family is physically active	47	48
9.	I have tried marijuana once or twice	23	77
10.	I use marijuana on a regular basis	7	93
11.	I have tried alcohol once or twice	61	39
12.	I use alcohol on a regular basis	6	94
13.	I have tried tobacco once or twice	36	64
14.	I use tobacco (smoke) on a regular basis	4	96
15.	One (or both) of my parents smoke cigarettes	61	39
16.	One (or both) of my parents drink alcohol	52	48
17.	I almost always wear a seat belt when riding in a car	34	66

TABLE 3

Differences and Relationships Between Sex Gender and Self-Reported Behaviors

Variable	Male		Female		N	x^2	SIG.	ø
	Yes	No	Yes	No				
1. Always eats a good breakfast	29	22	22	17	90	1.84	NS	-
2. Tried marijuana once or twice	17	34	4	35	90	6.58	.05	0.27
3. Tried alcohol once or twice	38	13	17	22	90	8.89	.01	0.31
4. Tried tobacco once or twice	25	26	7	32	90	9.31	.01	0.32
5. Almost always wear seat belt	11	40	9	30	90		NS	

df = 1, x^2 must be equal to or larger than 3.84 for sig. at .05 level/6.635 at .01 level of sig.

TABLE 4

Relationship Between Reported Use of a Drug (Experimental or Regular) and Parental Use of Alcohol

STUDENT	PARENT(S)DRINK(S) ALCOHOL YES	NO	N	x^2	SIG.	ø
USE DRUGS	40	26	17	6.97	.01	0.28
NEVER USED DRUGS	7	17				

TABLE 5

Relationship Between Reported Use of a Drug (Experimental or Regular) and Parental Use of Tobacco

STUDENT	PARENT(S) SMOKE(S) YES	NO	N	x^2	SIG.	ø
USE DRUGS	38	23	88	0.11	NS	
NEVER USED DRUGS	17	12				

TABLE 6

Relationship Between Reported Vigorous Exercise and Family Exercise

STUDENT (Vigorous Exercise)	FAMILY PHYSICALLY ACTIVE YES	NO	N	x^2	SIG.
YES	40	30	90	3.06	NS
NO	7	13			

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TABLE 7

Descriptive Measures on Selected Variables for Sampled Population

VARIABLE	N	$\bar{X}$	SD	t(DEP)
1. Pretest-Knowledge	87	56.29	18.26	*9.63
2. Posttest-Knowledge	87	68.59	18.68	
3. Attitudes About Health	85	29.12	5.2	
4. General Locus of Control	86	3.88	1.88	
5. Health Locus of Control	86	5.09	1.7	
6. Self-Evaluation Inventory	90	78.6(3.74)	10.49	

Notes

1.& 2. Knowledge Test 100 items multiple choice. Pretest administered in September/ Posttest in January. *With df=86, 2.63 or greater required for significance at .01 level.

Instruments 3 through 6 administered in January 1981

3. Health Attitudes Survey had 45 items, marked as either "agree" or "disagree" with either a True or False Statement.

4. General Locus of Control Scale (Potter) has 11 items, on continuum
0=Internal Locus of Control/11=External Locus of Control

5. Health Locus of Control Scale has 11 items, on continuum
0=High Internal Locus of Control/11=High External Locus of Control

6. Self-Evaluation Inventory had 21 items, each measured using LIKERT SCALE where 1=Not at All True of Me; 2=Slightly True of Me; 3= Somewhat True of Me 4=Mostly True of Me; 5=Completely True of Me. Each variable represented by cluster of three items; clarity of personal long term goals; values-acceptance of personal responsibility; Self-Esteem; Self-Concept in Social Relationships; Decision-Making; General Communication; Caring-Expressing Concern for Others. In table $\bar{X}$ = average out of 105 possible, ( ) = $\bar{X}$ on LIKERT SCALE over all items.

TABLE 8

Bivariate Analysis of Relationships Between Two Variables

VARIABLE X	VARIABLE Y	N(Pairs)	r	t
1. Posttest-Knowledge	Health Attitudes	74	0.65	*15.76
2. General Locus of Control	Health Locus of Control	86	0.21	**18.77
3. Health Locus of Control	Self-Evaluation	83	-0.03	NS
4. Health Locus of Control	Health Attitudes	85	0.012	NS
5. General Locus of Control	Health Attitudes	85	-0.08	NS
6. Posttest-Knowledge	General Locus of Control	75	-0.38	3.5
7. Self Evaluation	Posttest Knowledge	78	0.56	5.89

t test on test of significance on sample correlation sufficient (null p=o) and (alternate p = 0) when df = 72*, t must equal or exceed 2.650 for sig. at .01 level, and where df = 84**, t must equal or exceed 2.634 for sig.at.01 level

95% confidence interval (r = 0.65, n = 74) = .63 to +.83
95% confidence interval (r = 0.21, n = 86) = -.08 to +.43

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TABLE 9

Selected Comparisons Between Groups (Selected Health Behaviors) and Selected Psychological Measures

VARIABLE		GROUP A	GROUP B	t	CRITICAL VALUE
		Seat Belt Users	Non-Users		
Health Locus of Control	N	29	53		
	$\bar{X}$	5.24	5.06	0.45	NS
	SD	1.41	1.88		
Self-Evaluation Inventory		Used Drugs	Never Used Drugs		
	N	60	29		
	$\bar{X}$	77.6	80.9	1.38	NS
	SD	11.27	8.53		
Self-Evaluation Inventory		Regular Drug Use	Never Used/Experimented Only		
	N	10	81		
	$\bar{X}$	61	79.75	0.36	NS
	SD	17.61	10.16		
Health Attitudes		Seat Belt Users	Non-Users		
	N	28	54		
	$\bar{X}$	29.93	29.00		NS
	SD	4.63	5.39		